

**What Is Claimed Is:**

1. An internet telephone, comprising:
  - a data loss decision unit for deciding whether there is a voice data lost in the voice data packet received via the internet network and outputting the position information for the lost portion of the voice data; and
    - a waveform recovery unit for duplicating a voice data normally received previously to the lost portion and filling the same in the lost portion of the voice data according to the position information.
- 10 2. The internet telephone of claim 1, the data loss decision unit decides whether the voice data is lost or not by detecting whether the voice data is omitted from the portions at which voice data must exist in a predetermined sequence in the voice data packet.
- 15 3. The internet telephone of claim 1, wherein the data loss decision unit decides a received section with a level lower than a given threshold among sections in the voice data packet as a lost section.
- 20 4. The internet telephone of claim 1, wherein the voice data that is duplicated and filled in the lost portion is a normal voice data received previously to the voice data corresponding to the lost portion.
- 25 5. The internet telephone of claim 1, wherein the internet telephone further comprises a waveform discontinuity handling unit for removing the discontinuity between the originally received voice data and the duplicated and filled voice data from the output signal of the waveform recovery unit.
- 30 6. The internet telephone of claim 5, wherein the waveform discontinuity handling unit measures a discontinuous distance D using the position information for the lost portion and readjusts the values of at least one voice data sample of the voice data positioned previous to the discontinuous distance and the values of at least one voice data sample of the voice data positioned next to the discontinuous distance so that the discontinuous distance can be reduced.

7. The internet telephone of claim 6, wherein the waveform discontinuity handling unit readjusts the values of at least one sample selected by adjustment values obtained by adapting weight values appropriate as the discontinuous distance D.

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8. The internet telephone of claim 7, wherein those adjustment values are obtained by dividing the discontinuous distance D by  $2^n$  ( $n=1,2,3,\dots$ ) values.

9. The internet telephone of claim 8, wherein, when  $n$  is 1, 2 and 3, three voice data samples P[1], P[2] and P[3] are selected as samples of the voice data positioned previous to the discontinuous distance D and three voice data samples Q[1], Q[2] and Q[3] are selected as samples of the voice data positioned next to the discontinuous distance;

sample P[1] is moved toward Q[1] by D/4 and sample Q[1] is moved toward P[1] by D/4;

sample P[2] is moved toward Q[1] by D/8 and sample Q[2] is moved toward P[1] by D/8; and

sample P[3] is moved toward Q[1] by D/16 and sample Q[3] is moved toward P[1] by D/16.

10. An internet telephone, comprising:

a protocol processor for separating the compressed and encoded voice data from the voice data packet transmitted via the internet network;

a data loss decision unit for deciding whether the voice data is lost or not by analyzing the compressed and encoded data and for outputting the position information for the lost portion of the voice data if the voice data is lost;

a voice decoder for restoring the compressed and encoded voice data having passed the data loss decision unit to the digital voice data;

a waveform recovery handing unit for performing waveform recovery for the lost portion by filling the duplicated previous normal voice data in the lost portion of the restored digital voice data based on the position information;

a waveform discontinuity handling unit for removing waveform discontinuity between the

original voice data and the duplicated previous normal voice data in the recovered voice data;  
a digital/analog converter(DAC) for converting the digital voice signal outputted from the waveform discontinuity handling unit into the analog voice signal; and  
a speaker for inputting the analog voice signal and outputting the voice of the caller.

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11. The internet telephone of claim 10, wherein the data loss decision unit decides a received section with a level lower than a given threshold among sections in the voice data packet as a lost section.

10 12. The internet telephone of claim 10, wherein the voice data that is duplicated and filled in the lost portion is a normal voice data received previously to the voice data corresponding to the lost portion.

13. The internet telephone of claim 10, wherein the waveform discontinuity handling unit measures a discontinuous distance D using the position information for the lost portion and readjusts the values of at least one voice data sample of the voice data positioned previous to the discontinuous distance and the values of at least one voice data sample of the voice data positioned next to the discontinuous distance so that the discontinuous distance can be reduced.

20 14. The internet telephone of claim 13, wherein the waveform discontinuity handling unit readjusts the values of at least one sample selected by adjustment values obtained by adapting weight values appropriate as the discontinuous distance D.

25 15. The internet telephone of claim 14, wherein those adjustment values are obtained by dividing the discontinuous distance D by  $2^n$  ( $n=1,2,3,\dots$ ) values.

16. A method for recovering voice data lost in an internet telephone, the method comprising the steps of:

30 deciding whether a voice data is lost and obtaining the position information for a lost portion of the voice data by analyzing a voice data packet received via the internet network;  
duplicating a normal data received previously to the lost portion;

filling the duplicated normal voice data in the lost portion in the voice data based on the position information in order to recover the voice data; and

removing waveform discontinuity between the original voice data and the duplicated previous normal voice data in the recovered voice data.

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17. The method of claim 16, wherein, in the step of deciding whether the voice data is lost, a received section with a level lower than a given threshold is decided as a lost portion among sections in the voice data packet.

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18. The method of claim 16, wherein, in the step of deciding whether the voice data is lost, whether the voice data is lost or not is decided by detecting whether the voice data is omitted from the portions at which voice data must exist in a predetermined sequence in the voice data packet.

19. The method of claim 16, wherein the step of removing waveform discontinuity comprises the steps of:

measuring a discontinuous distance D by using the position information;

selecting the values of at least one voice data sample of the voice data positioned previous to the discontinuous distance and the values of at least one voice data sample of the voice data positioned next to the discontinuous distance; and

readjusting the value of the selected samples so that the discontinuous distance can be reduced.

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20. The method of claim 19, wherein the values of at least one sample selected are readjusted by adjustment values obtained by adapting weight values appropriate as the discontinuous distance D

21. The method of claim 20, wherein those adjustment values are obtained by dividing the discontinuous distance D by  $2^n$  ( $n=1,2,3,\dots$ ) values.